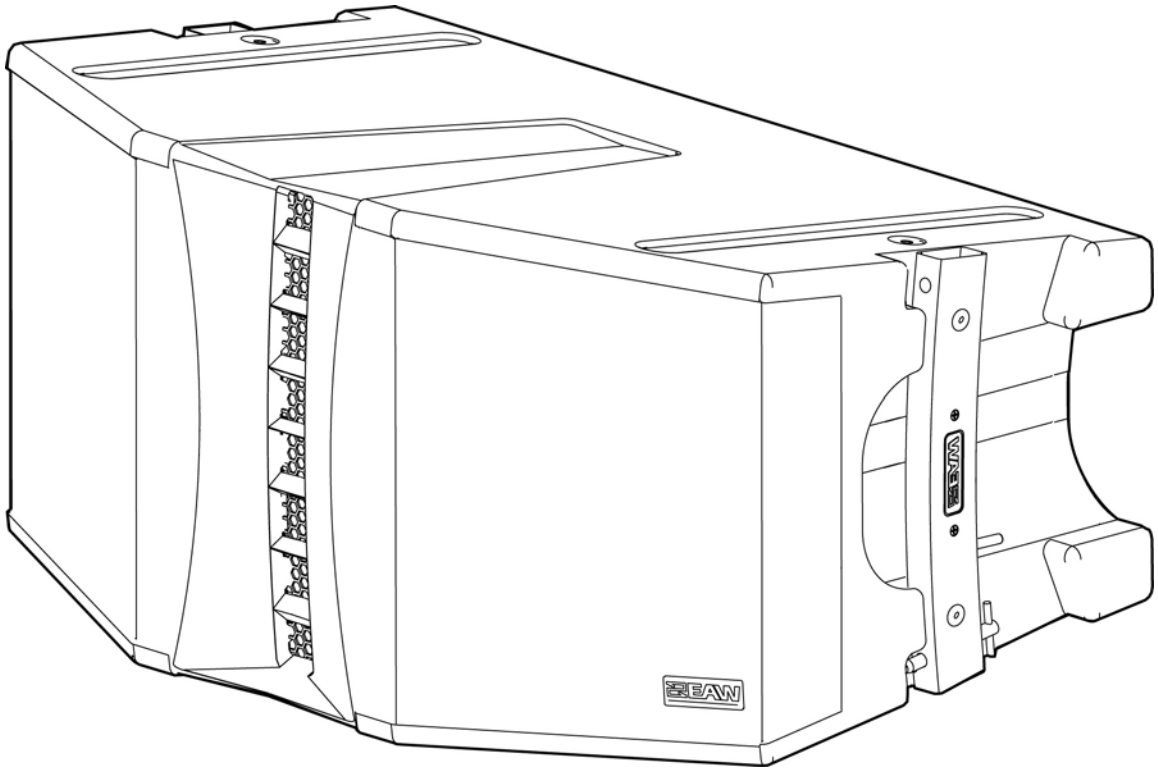
JFL SERIES LOUDSPEAKER
OWNER'S MANUAL



EAW Part: RD0465(A)

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1. READ THIS FIRST

Congratulations on the purchase of your new EAW loudspeaker. You now own one of the finest professional audio products available - the result of exceptional engineering and meticulous craftsmanship.

This manual is intended for use with JFL210 and JFL118 loudspeakers. As such, it contains information that is specific to these loudspeakers. This includes: array design, user adjustments, amplifier power ratings, input connections, rigging design, and service and maintenance information. An optional FB121 Fly Bar may be used to suspend JFL210 and JFL118 loudspeakers and ground stack JFL210 loudspeakers. The accompanying FB121 Rigging & Ground Stack Instructions should be consulted for information specific to its use. Finally, information common to all types of EAW loudspeakers may be found in the accompanying EAW Loudspeaker Owner's Manual. This includes: general safety precautions, unpacking/return instructions, rigging definitions, amplifier selection best practices, signal processing , inspection and maintenance practices, as well other information common to all loudspeakers.

All three manuals thus apply to the JFL210 and JFL118 loudspeakers. Please read each and follow all relevant precautions and instructions. This should allow you to obtain the maximum performance from your new loudspeaker. Where there are conflicts or overlaps, the information in this manual supersedes the information in any accompanying manual.

1.1 SAFETY PRECAUTIONS

The terms "Caution," "Warning," and "Danger" are used throughout this manual to alert the reader to important safety considerations. If you have any questions about any aspects of these precautions, contact your local dealer, distributor, or EAW. The following are the descriptions of the safety precautions.

CAUTION: describes an operating condition or user action that may expose the equipment or user to potential damage or danger.

WARNING: describes an operating condition or user action that will cause damage to the equipment or injure the user.

DANGER: describes an operating condition or user action that will immediately damage the equipment or be extremely dangerous or possibly life-threatening to the user.

1.2 GENERAL PRECAUTIONS

WARNING: *Some aspects of rigging and other related fields for which EAW manufactures, sells, or distributes equipment are potentially hazardous. Any people using this equipment are personally responsible for their own safety. EAW transactions are made with the assumption that the purchaser is a qualified individual or will have only qualified individuals perform work with the equipment. EAW will not be liable for any damages arising from the use of equipment sold to purchaser.*

WARNING: *Only persons with the knowledge of proper hardware and safe rigging techniques should attempt to suspend JFL210 and JFL118 loudspeaker systems overhead. Failure to follow this precaution may result in damage to the equipment, injury, or death.*

2. INTRODUCTION

The JFL Series is a compact format, constant curvature line array system for venues with listener distances up to about 45 m / 148 ft. It is designed to be incredibly simple to deploy, yet provide the highest output possible from a compact line array format. The Series includes the 2-way JFL210 full-range loudspeaker and the complementary single 18 inch JFL118 subwoofer.

This manual provides information about the design, configuration, and operation of JFL210 and JFL118 Line Arrays. It is intended to be used in conjunction with the Windows®-based *JFLWizard* software. Please thoroughly familiarize yourself with this manual.

The JFL210 and JFL118 are physically configured for both temporary installation and permanent installation. Rigging information for these purposes may be found in this manual and the accompanying *FB121 Rigging & Ground Stack Instructions*.

3. UNPACKING

3.1 CONTENTS

JFL210

(1) JFL210 Loudspeaker
(2) QRP-JFL Quick Release Pins
(1) JFL210 & JFL118 Loudspeaker Owner's Manual
(1) FB121 Rigging & Ground Stack Instructions
(1) EAW Loudspeaker Owner's Manual

JFL118

(1) JFL118 Subwoofer
(3) QRP-JFL Quick Release Pins
(1) JFL210 & JFL118 Loudspeaker Owner's Manual
(1) FB121 Rigging & Ground Stack Instructions
(1) EAW Loudspeaker Owner's Manual

4. JFL210 ARRAY DESIGN

4.1 JFLWIZARD SOFTWARE

Use the *JFLWizard* software for designing JFL210 arrays. It may be found in the *Downloads/Software* section of the EAW website: http://www.eaw.com/downloads/. The *JFLWizard's* primary function is to determine the configuration that will provide the best vertical performance for a given application. Venue dimensions, the number of enclosures, array aiming angle, and Fly Bar pick point can be entered manually. Given this information, the Wizard calculates resultant array performance. For complete instructions about operating the *JFLWizard*, click on the About/Help menu when running the software.

4.1.1 Computer Requirements

The *JFLWizard* requires an IBM-compatible PC with the Windows® 98, Windows® 98SE, Windows NT®, Windows® 2000, Windows® ME, or Windows® XP operating systems. The *JFLWizard* should run in Windows® Vista, but full support is unknown at press time. Windows® 3.x, Windows® 95, and Macintosh® operating systems are not supported..

4.1.2 JFLWizard Results

- Graphical representations of the array and the venue
- On-axis aiming angle for each enclosure as a difference from 0° horizontal
- Various angles and throw distances calculated from the venue's dimensions
- Difference between the array beamwidth angle and the needed coverage angles
- Height of the array and trim height to the bottom of the array from the floor
- Pick Point on the Fly Bar to achieve the calculated array angle when suspended
- Weight of the array

4.2 GROUND STACKING

Normally, a ground-stacked JFL Series main array is used where suspension is not possible, too difficult, or too time-consuming. JFL210 – with or without JFL118 – are also quite effective when used in stage side fill or audience front fill applications.

Both JFL210s and JFL118s may be ground-stacked alone or in combination. In combination, always stack JFL210s on top of JFL118s. The recommended minimum and maximum array quantities are:

Array	Min	Max
JFL210 alone*	1	4
JFL118 alone	1	4
JFL210 / JFL118	1/1	4 / 2

** Two or more JFL210 must be stacked on accessory FB121 Fly Bar.*

WARNING: *Ground-stacked arrays, especially the maximum recommended arrays, may present a tipping hazard and require assembly by personnel qualified to ensure adequate stability. See the* FB121 Rigging & Ground Stack Instructions *for correct array assembly. Mechanical assistance may be required to lift and position enclosures for arrays taller than approximately 5 feet.*

4.3 SUBWOOFERS IN THE ARRAY

4.3.1 General Considerations

Although the low frequency performance of JFL Series arrays allows them to be used without subwoofers for some events, subwoofers will normally be used for live musical performances. The recommended subwoofer is EAW's JFL118, specifically designed to complement JFL210 line arrays.

NOTE: *Bass performance is often highly program- or venue-dependent, as well as subjective as to quantity and quality. For this reason the type, quantity, and disposition of subwoofers may vary considerably with the application. The quantity recommendations below are for general purposes, providing a balanced system for most music applications. Quantities may need to be adjusted up or down for specific situations.*

4.3.2 JFL118 Subwoofers

JFL118 subwoofers are designed to complement the JFL210 loudspeakers to both extend the low frequency response and provide more output for the upper low frequencies. JFL118 subwoofers may either be ground stacked, flown as part of a JFL210 array, or flown separately alongside a JFL210 array.

A general recommendation is to use JFL210s and JFL118s in a 2:1 ratio.

4.3.3 Suspending JFL118 Subwoofers

The JFL118 enclosure rigging is designed to directly couple to an FB121 Fly Bar and JFL210 enclosures. As such, the JFL118 can be rigged seamlessly with JFL210s. See the *FB121 Rigging & Ground Stack Instructions* for more detailed information on rigging a JFL118.

The JFL118s should be the uppermost enclosures when flown as part of a JFL210 array. In this application, the JFL118s are suspended flat-fronted, with the JFL210s suspended below in a constant curvature array. When flown separately, JFL118s should be flown so that the spacing between the line of JFL118 enclosures and JFL210 enclosures is less than 1 m / 3.3 ft.

4.3.4 Signal Delay on Subwoofers

If JFL118s are flown or stacked with JFL210s as configured in the Line Array Wizard, use the factory signal delay settings.

For other configurations or subwoofers, it will usually be necessary to determine the signal delay settings by measurement.

5. ARRAY OPERATION

5.1 OVERVIEW

The operation of a JFL Series system involves:

1. Understanding the principles on which it operates.
2. Knowing how to electronically configure it for a specific task.

5.2 ENGINEERING DESIGN

The *JFLWizard* software uses the fixed splay angle of the enclosure and the desired coverage pattern to determine the quantity of enclosures in the array that will optimize coverage for the audience distances and angles within the venue. The basic principle to remember is that more enclosures provide greater vertical coverage and fewer enclosures provide less vertical coverage.

5.3 SYSTEM BLOCK DIAGRAM

The JFL118 powering mode is single-amp only. The JFL210 has two powering modes: single-amp and bi-amp. A JFL210 operated in single-amp mode only requires a high pass filter for low frequency excursion protection. This may be implemented in a DSP (Digital Signal Processor), equalizer, or amplifier with integrated high pass filter. The recommended filter is 60 Hz, 12 to 24 dB Butterworth.

A DSP with two outputs is required to operate the JFL210 in bi-amp mode or to operate a JFL210 in single-amp mode with a JFL118 subwoofer. A DSP with three outputs is required to operate the JFL210 in bi-amp mode with a JFL118 subwoofer.

The block diagrams in *Figure 5.3* show the possible signal flows for a single JFL210 with JFL118. Use the same processor outputs for additional JFL210s and JFL118s on the same mix bus, i.e. “Left”, “Right”, or “Fill”.

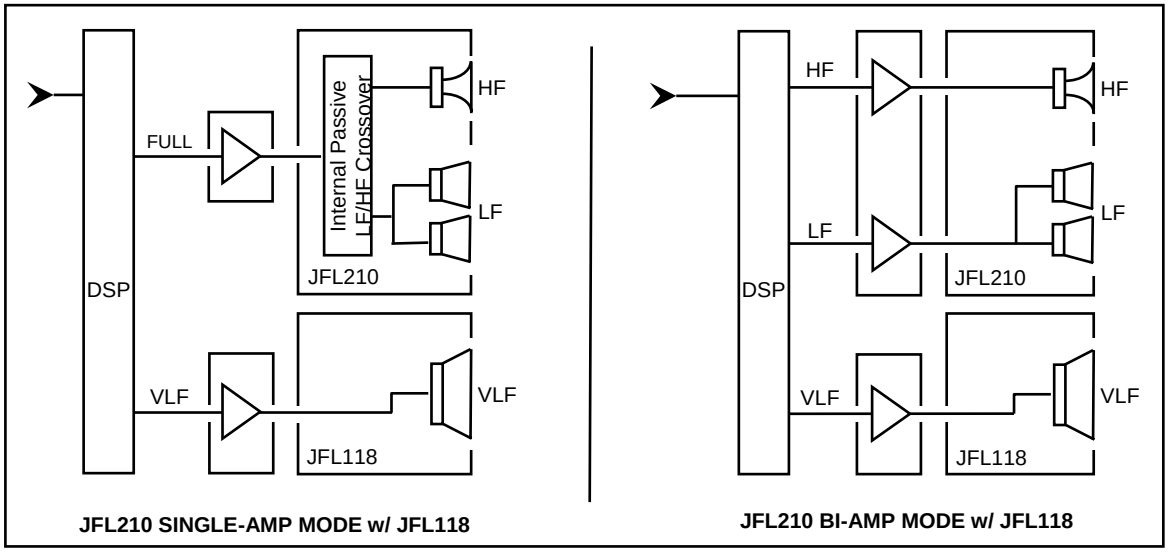


Figure 5.3

5.4 SIGNAL PROCESSING

5.4.1 Factory Digital Signal Processing Settings

Factory DSP settings are available for download at http://www.eaw.com/downloads/ . The signal processing adjustments determined by EAW for JFL Series products should be fully implemented “as is.” Array performance, in terms of frequency response, beamwidth consistency, output level capability, and wavefront coherency is dependent on the EAW engineered crossover and other processing settings. These settings are determined from extensive measurements in laboratory environments and in typical venues. As such, they will normally provide excellent results in a variety of venues.

5.4.2 Non-EAW Digital Signal Processors

Even though non-EAW Digital Signal Processors can be set to numerically equal values, the actual transfer function (magnitude and phase) of the processing depends on the particular digital processor. The reason is that different algorithms can be and are used to implement the same processing functions. The factory settings were determined using EAW’s UX8800 Digital Signal Processor. If you will be using a non-EAW DSP, contact EAW about its compatibility with the EAW factory settings.

5.5 USER ADJUSTMENTS

5.5.1 JFL210 HF Shading – Single-Amp Mode

The JFL210 has a switchable HF character while in single-amp mode, controlled by the three position toggle labeled “HF Shading.” Each of the three positions is suitable for different scenarios. Be sure to select the HF shading character most appropriate for the application when using the JFL210 in single-amp mode:

- *Single Box* — This switch position provides an HF character that is suitable for use with a single JFL210 that is not used in an array.
- *Multi Box* — This switch position provides an HF character that is suitable for use with multiple JFL210s in an array in short to medium throw applications (approximately 1 m-20 m).
- *Long Throw* — This switch position provides an HF character that is suitable for use with multiple JFL210s in an array in long throw applications (approximately 20-30 m). Using this switch position will maintain tonal balance at long distances by adding compensation to those frequencies that suffer attenuation due to air loss. In an array where some JFL210s are being used for short to medium distances and some are used for long distances, it is appropriate to mix Long Throw and Multi Box settings as needed.

5.5.2 JFL210 HF Shading – Bi-Amp Mode

The single-amp HF shading toggle switch described in the preceding section is disabled when the JFL210 is operated in bi-amp powering mode. HF shading functions are instead replicated in DSP. Recommended settings are available on the EAW website. In an array where some JFL210s are being used for short to medium distances and some are used for long distances, it is appropriate to use multiple HF outputs in DSP to implement mixed shading.

5.6 AMPLIFIER POWER REQUIRMENTS

The performance of the JFL210 and JFL118 depends on amplifiers delivering an adequate supply of clean power, as is true of all professional loudspeaker systems. For information on selecting amplifiers, please consult the accompanying EAW Loudspeaker Owner’s Manual.

5.6.1 Power Ratings

The JFL210 requires one full range amplifier channel when operated in single-amp mode and two amplifier channels – low frequency and high frequency – when operated in bi-amp mode. The JFL118 requires only one amplifier channel. *Table 5.6.1* lists the rms voltage limits for the JFL210 and JFL118. Because of their higher impedance design, multiple JFL210s and JFL118s can be powered from single amplifier channels.

NOTE: *The rms Voltage Limit listed for each sub-system (Full Range, LF, HF, and SUB) is the* ***same*** *for any enclosure quantity. The wattages are calculated using the Voltage Limits and the overall nominal impedance for the each listed quantity of JFL210 and JFL118 loudspeakers.*

JFL210 Qty	Nominal Z	Single-Amp Full Range	Bi-Amp LF	Bi-Amp HF
1	8	800 W	800 W	150 W
2	4	1600 W	1600 W	300 W
3	2.7	2400 W	2400 W	450 W
4	2	3200 W	3200 W	600 W
rms Voltage Limit:		**80 V**	**80 V**	**75 V**

JFL118 Qty	Nominal Z	SUB
1	8	800 W
2	4	1600 W
3	2.7	2400 W
4	2	3200 W
rms Voltage Limit:		**80 V**

Table 5.6.1

CAUTION: *The rms voltage limits listed above are related to the thermal limits determined from EAW's standard power test. In this test, transducers are "exercised" to a point of damage or failure. The test signal has a 6 dB crest factor (peak to average ratio). A maximum continuous voltage limit for the loudspeaker is then determined based on the test results and on the transducer's application in the loudspeaker. The powers listed in the table are calculated as the square of the rms voltage limit divided by the sub-system's nominal impedance (Z) in ohms.*

5.7 INPUT CONNECTIONS

JFL210 and JFL118 loudspeakers utilize Neutrik® Speakon® STX Series connectors. The STX Series' all-metal housings are extremely rugged, and feature a built-in gasket providing weather protection to IP54. Note that only the NLT4FX in-line cable connector will provide rated protection against the elements.

5.7.1 JFL210 Input Connections

There are two Neutrik NLT4MP connectors on the rear of each JFL210. These connectors mate with Neutrik NLT4FX, NL4FC, and all other NL4-compatible in-line cable connectors. The following subsections describe the electrical connections for each operating mode.

5.7.1.1 Single-amp Mode

JFL210 INPUT NL4 x2; see *Figure 5.7.1.1.*

PIN 1 -	-
PIN 1+	+
PIN 2 -	Loop
PIN 2+	Loop

NL4 #1: Use as the input to the JFL210.
NL4 #2: Use the second connector to loop the full range signal to the next JFL210. Note that an additional signal can be carried on pins 2 +/- without affecting the operation of the JFL210.

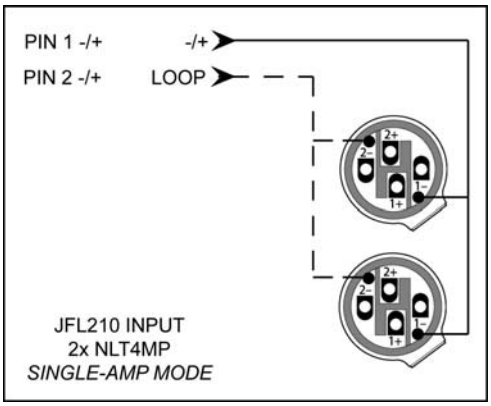


Figure 5.7.1.1

5.7.1.2 Bi-amp Mode

JFL210 INPUT NL4 x2; see *Figure 5.7.1.2.*

PIN 1 -	LF -
PIN 1+	LF+
PIN 2 -	HF -
PIN 2+	HF+

NL4 #1: Use as the input to the JFL210.
NL4 #2: Use the second connector to loop the LF and HF signals to the next JFL210.

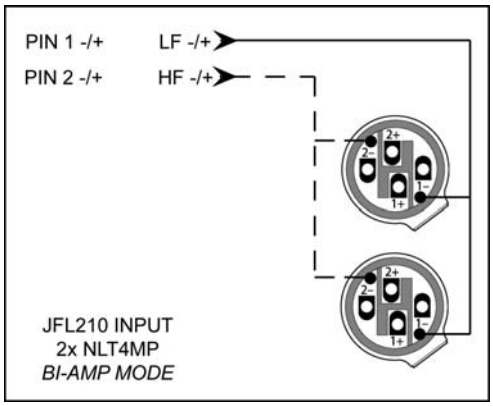


Figure 5.7.1.2

5.7.2 JFL118 Connections

There are three Neutrik NLT4MP connectors on the rear of each JFL118 – see *Figure 5.7.2*. Two are used for sub and high-passed signal input, while the third is used as an output to loop the high-passed signal to JFL210 or other loudspeakers. These connectors mate with Neutrik NLT4FX, NL4FC, and all other NL4-compatible in-line cable connectors.

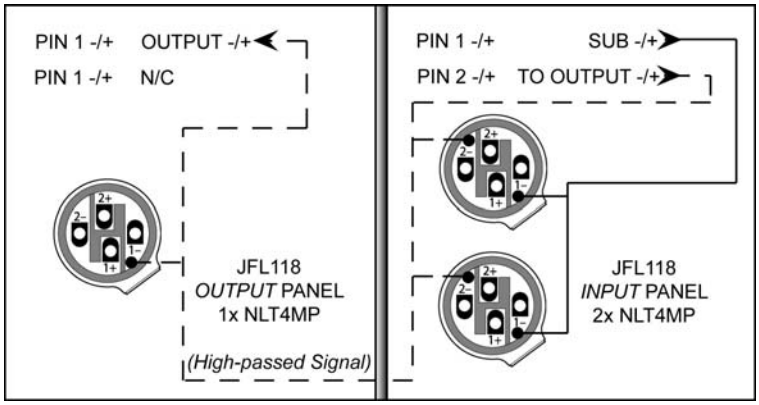


Figure 5.7.2

SUB INPUT PANEL NL4 x2

PIN 1 -	SUB Input -
PIN 1+	SUB Input +
PIN 2 -	Loop To Output Panel PIN 1 -
PIN 2+	Loop To Output Panel PIN 1+

NL4 #1: Use as the input to the JFL118.
NL4 #2: Use the second connector to loop the subwoofer signal applied to Pins 1 +/- to a subsequent JFL118. Note that a high-passed signal carried on pins 2 +/- of the input connectors is looped to pins 1 +/- of the output connector without affecting the operation of the JFL118.

SUB OUTPUT PANEL NL4 x1

PIN 1 -	OUTPUT - (from Input Panel PIN 2 -)
PIN 1+	OUTPUT+ (from Input Panel PIN 2+)
PIN 2 -	No Connection
PIN 2+	No Connection

NL4 #3: Use as a loop-through, high-passed connection to JFL210 or other loudspeakers.

6. RIGGING & HANDLING

JFL Series arrays may be suspended via M10 mounting points or the accessory FB121 Fly Bar, ground-stacked, tripod-mounted, or pole-mounted. This manual will cover suspension using M10 mounting points and tripod / pole mounting applications. Suspension using the FB121 Fly Bar and ground-stacking applications are detailed in the accompanying *FB121 Rigging & Ground Stack Instructions.* Both documents recommend rigging and handling methods for most situations. Specific situations may require other methods. It is the user's responsibility to determine the viability and safety for alternate methods and to implement them accordingly.

6.1 RIGGING OVERVIEW

The JFL210 full range loudspeaker has one Rigging Tube on each enclosure side – two in total. The JFL118 subwoofer has one Rigging Tube on each enclosure side and one Rigging Tube on enclosure rear – three in total. Each Tube contains a captive Latch which slides down and attaches to the Rigging Tubes of an adjacent enclosure via a 46 mm / 1.8 in Quick Release Pin – see *Figure 6.1a*.

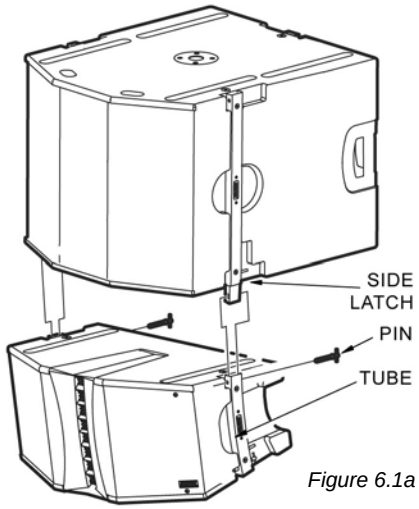
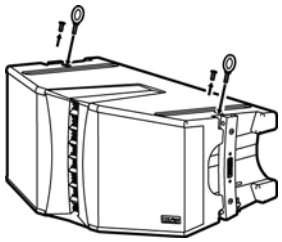


Figure 6.1a

DANGER: *Ensure each Quick Release Pin used in assembling an array is fully inserted and engaged into the Tube and Bar holes. Only use the supplied Quick Release Pins or equal. Pins of different lengths, diameter, or material will compromise the structural integrity of the rigging system and may result in damage to the equipment, injury, or death.*



Each product also includes M10 threaded Permanent Installation (PI) suspension points on enclosure top and bottom – two each for JFL210 and three each for JFL118. *Figure 6.1b* illustrates their locations in the JFL210 top panel. M10 forged shoulder eyebolts or similar load-rated hardware may be used in these points when deploying JFL Series products in permanent installation applications.

Figure 6.1b

6.2 RIGGING WARNINGS

WARNING: *Suspending anything, especially overhead of people, should be done with extreme caution. Always engage the services of a certified professional who is qualified to determine and implement the requirements for overhead rigging. Only persons with the knowledge of proper hardware and safe rigging techniques should attempt to suspend JFL210 Series arrays overhead. Failure to follow these precautions may result in damage to the equipment, injury, or death.*

DANGER: *When suspending or stacking JFL210s and JFL118s, avoid placing any parts of the body between the enclosures or between an enclosure and the Fly Bar. Always use the integral handles to lift or position enclosures. Failure to follow this precaution may result in damage to the equipment, injury, or death.*

CAUTION: *A JFL210 weighs approximately 23.6 kg / 52 lb. This, along with the physical size, means that one person may be able to lift and carry it. However, always use proper lifting techniques to avoid injury. Use good judgment to determine if you need lifting assistance such as another person, a back support belt, or mechanical assistance. Because it weighs approximately 44.5 kg / 98 lb, always use two people or mechanical assistance to lift a JFL118.*

Please see Section 4 "Rigging / Mounting / Suspension" and Section 5 "Rigging Design" in the accompanying EAW Loudspeaker Owner's Manual *for additional, important rigging information.*

6.3 PERMANENT INSTALLATION SUSPENSION

6.3.1 PI Array Working Load Limit (WLL)

WARNING: *When the M10 threaded Permanent Installation (PI) suspension points are used the array Working Load Limit (WLL), Total Vertical Pull, is limited to six (6) any combination JFL210 or JFL118 Loudspeakers. The WLL Design Factor is 10:1.*

WEIGHTS: *JFL210 Loudspeaker: 52 lb / 24.0 kg; JFL118 Loudspeaker: 98 lb / 44.5 kg*

6.3.2 A Note On Eyebolts

Load-rated eyebolts are commonly used with threaded suspension points. Eyebolts used with JFL210 and JFL118 loudspeakers must posses the following attributes:

- *Type:* Shoulder pattern
- *Thread Size:* M10 x 1.5
- *Shank Length:* Minimum 35 mm
- *WLL:* Minimum 740 kg / 1628 lb

Figure 6.3.2

CAUTION: Eyebolt Working Load Limits are significantly de-rated when angular lifts are applied. If an application requires an angular lift greater than 45 degrees a swivel hoist ring or similar fitting must be used – see *Figure 6.3.2* for an example. These fittings have full swivel and pivot action, which helps avoids side loads.

6.3.3 Permanent Installation Overview

The JFL210 and JFL118 enclosures may be suspended in a permanent installation without the accessory FB121 Fly Bar. In these applications user-supplied M10 x 1.5 x 35 mm forged shoulder eyebolts or load-rated equivalent are installed in an array's top and bottom enclosures. The top eyebolts are used for primary suspension and to set the array trim height, while the bottom eyebolts are used as pullback points to set the array tilt angle.

The following instructions pertain specifically to eyebolt installation and array handling when using said eyebolts. Join enclosures within an array by following the procedures described in the accompanying *FB121 Rigging & Ground Stack Instructions.*

6.3.4 JFL210 Arrays

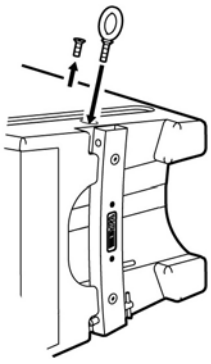


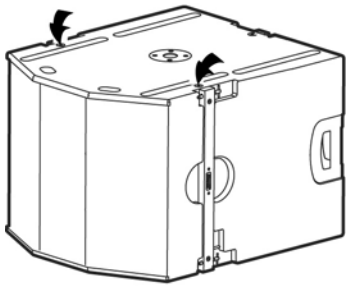
Figure 6.3.4

a. Using a 6 mm Allen wrench, remove the two (2) flat head screws from the top panel of the uppermost array enclosure. These screws are immediately adjacent to the side Rigging Tubes – see *Figure 6.3.1.*
b. Thread two (2) user-supplied M10 x 1.5 x 38 mm forged shoulder eyebolts through the exposed mounting points, making sure the eyebolt shoulders are firmly seated against the enclosure. Orient each eyebolt so that the load will be applied within the plane of the eye.
c. Attach the hoist mechanism and cables to the eyebolts with user-supplied Screw Pin Anchor Shackles. Minimum allowable Shackle size is 0.75 T, 9 mm / 0.31 in.
d. Hoist the array such that the bottom array enclosure is set to a comfortable working height.
e. Using a 6 mm Allen wrench, remove the two (2) flat head screws from the bottom panel of the lowest array enclosure.
f. Thread two (2) user-supplied M10 x 1.5 x 38 mm forged shoulder eyebolts through the exposed mounting points, again making sure the eyebolt shoulders are firmly seated against the enclosure. Orient each eyebolt so that the load will be applied within the plane of the eye.
g. Attach the pull back mechanism and cables to the eyebolts with user-supplied Screw Pin Anchor Shackles. Minimum allowable Shackle size is 0.75 T, 9 mm / 0.31 in.
h. Choose a target array tilt angle as guided by *JFLWizard* software. Hoist the array to its desired trim height using the front point. Once trim is achieved, use the rear point to set the array tilt angle. See *Section 6.3.7* "Setting Array Tilt Angle" below for guidance.

6.3.5 JFL118 Arrays

a. Using a 6 mm Allen wrench, remove two (2) flat head screws from the top panel of the uppermost array enclosure. These screws are immediately adjacent to the *side* Rigging Tubes – see *Figure 6.3.5a*. Do not remove the screw adjacent to the single rear Rigging Tube.
b. Thread two (2) user-supplied M10 x 1.5 x 38 mm forged shoulder eyebolts through the exposed mounting points, making sure the eyebolt shoulders are firmly seated against the enclosure. Orient each eyebolt so that the load will be applied within the plane of the eye.
c. Attach the hoist mechanism and cables to the eyebolts with user-supplied Screw Pin Anchor Shackles. Minimum allowable Shackle size is 0.75 T, 9 mm / 0.31 in.
d. Hoist the array such that the bottom array enclosure is set to a comfortable working height.
e. Using a 6 mm Allen wrench, remove the flat head screw adjacent to the single rear Rigging Tube from the bottom panel of the lowest array enclosure – see *Figure 6.3.5b*.
f. Thread one (1) user-supplied M10 x 1.5 x 38 mm forged shoulder eyebolt through the exposed mounting point, again making sure the eyebolt shoulder is firmly seated against the enclosure. Orient the eyebolt so that the load will be applied within the plane of the eye.

Figure 6.3.5a



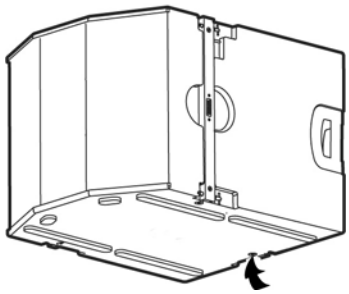


Figure 6.3.5b

g. Attach the pull back mechanism and cable to the eyebolt with a user-supplied Screw Pin Anchor Shackle. Minimum allowable Shackle size is 0.75 T, 9 mm / 0.31 in.
h. Choose a target array tilt angle as guided by *JFLWizard* software. Hoist the array to its desired trim height using the front point. Once trim is achieved, use the rear point to set the array tilt angle. See *Section 6.3.7* "Setting Array Tilt Angle" below for guidance.

6.3.6 Mixed JFL210 & JFL118 Arrays

Combinations of JFL210 and JFL118 Loudspeakers may be suspended in the same array. When doing so JFL118s are always suspended above JFL210s.

a. Follow Steps *a* through *d* in *Section 6.3.5* to first suspend JFL118 loudspeakers.
b. Join JFL210 loudspeakers to suspended JFL118 loudspeakers.
c. Follow Steps *e* through *g* in *Section 6.3.4* to attach the array pull back mechanism.
d. Choose a target array tilt angle as guided by *JFLWizard* software. Hoist the array to its desired trim height using the front point. Once trim is achieved, use the rear point to set the array tilt angle. See *Section 6.3.7* "Setting Array Tilt Angle" below for guidance.

6.3.7 Setting Array Tilt Angle

Normally the easiest method to determine array tilt angle is to use a clinometer such as the simple, bubble-type angle finder pictured in *Figure 6.3.7*. More sophisticated, albeit more expensive, electronic clinometers can also be used.

Place the angle finder against the grille of the uppermost array enclosure that can be physically reached. Adjust the angle of the entire array so that the face of this enclosure is set at its prescribed aiming angle given in the *JFLWizard* software.

Figure 6.3.7

6.4 TRIPOD AND POLE MOUNTING

6.4.1 Tripod Mounting

The JFL210 may be mounted on a tripod loudspeaker stand with a 35 mm / 1.38 in diameter pole. The tripod loudspeaker stand must be rated to support minimum 47.3 kg / 104 lb. The JFL210's integral pole-mount holes allow 0° and -15° aiming by choosing the hole specified in *Figure 6.4.1*. A maximum of two (2) JFL210 loudspeakers may be mounted on a tripod stand.

CAUTION: *All enclosures must be securely pinned together. To do so follow the procedures described in the accompanying* FB121 Rigging & Ground Stack Instructions*.*

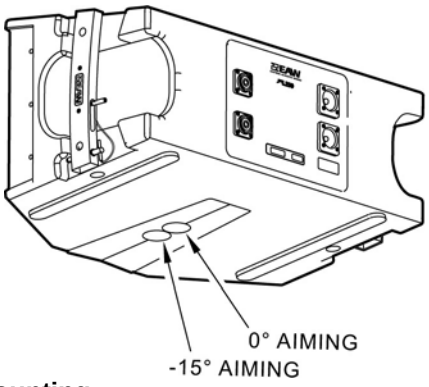
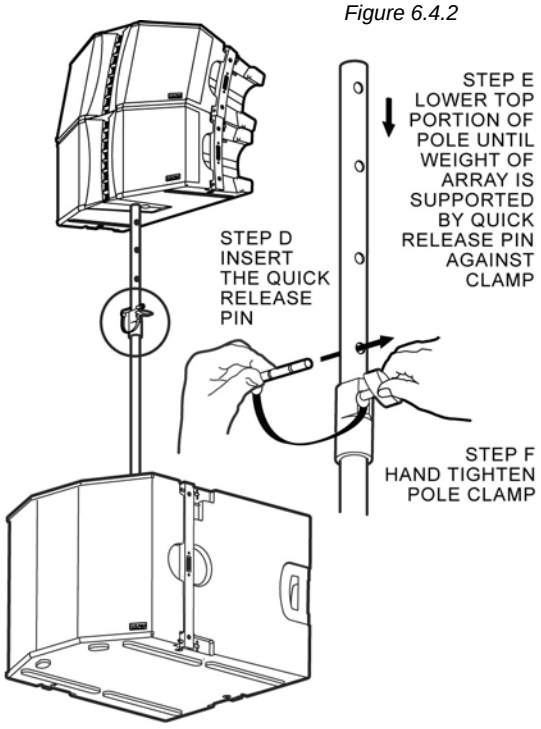


Figure 6.4.1

6.4.2 Pole Mounting

Up to two (2) JFL118 subwoofers may be used as a base for up to two (2) pole-mounted JFL210s. In this configuration a 35 mm / 1.38 in diameter loudspeaker pole is inserted between the JFL118's pole cup and either of the JFL210's integral pole mount holes. The latter holes allow the JFL210 to be aimed at 0° or -15° as described in *Section 6.4.1 Tripod Mounting*. The pole may be a fixed length or height adjustable. In either case it must be rated to support minimum 47.3 kg / 104 lb.

Figure 6.4.2



EAW's model SPM100 height-adjustable pole is an ideal companion – see *Figure 6.4.2*. A primary Quick Release Pin and secondary clamp mechanism is used to set JFL210 height. To use:

a. Stack up to two (2) JFL118 loudspeakers on a level, stable surface.
b. Insert the SPM100 pole in the uppermost JFL118's pole mount cup.
c. Remove the pole's Quick Release Pin from its stored position and loosen the clamp handle.
d. Raise the inner pole to the desired height and insert the Quick Release pin in the nearest through-hole.
e. Lower the inner pole so that the pin is resting atop the clamp mechanism.
f. Tighten the clamp handle so that the inner pole cannot easily rotate. Do not over-tighten; the Quick Release Pin should bear the weight of the JFL210.
g. Stack up to two (2) JFL210 loudspeakers on the SPM100 pole.

CAUTION: *All enclosures must be securely pinned together. To do so follow the procedures described in the accompanying* FB121 Rigging & Ground Stack Instructions*.*

7. SERVICE AND MAINTENANCE

7.1 GENERAL SERVICE

Please refer to *Section 11* “Inspection and Maintenance” and *Section 12* “Troubleshooting” in the accompanying *EAW Loudspeaker Owner’s Manual* for general Service, Maintenance, and Troubleshooting instructions.

7.2 PARTS REPLACEMENT KITS

In the event that a JFL Series loudspeaker requires field service, a number of Parts Replacement Kits are available through the EAW Service Department. These include but are not limited to:

- LF Woofer
- HF Diaphragm
- Left & Right Rigging Assemblies
- Quick Release Pin w/ Lanyard
- Input Panel Assembly
- Passive Crossovers
- Grilles
- HF Horn

Please see the *JFL210 Loudspeaker Replacement Kit Instructions*, available on the EAW website’s JFL product pages, for further information.

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